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Datasheet for the decision of 28 January 2025

Case Number: T 1163/23 - 3.2.05

Application Number: 16724410.2

Publication Number: 3297816

IPC: B29D30/72

Language of the proceedings: EN

Title of invention:
Recess pattern in a rubber article

Patent Proprietor:
4JET Technologies GmbH

Opponent:
Hankook Reifen Deutschland GmbH

Relevant legal provisions:
EPC Art. 56
RPBA 2020 Art. 12(4), 12(6)

Keyword:
Admittance (yes)
Inventive step (yes)

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Case Number: T 1163/23 - 3.2.05

D E C I S I O N
of Technical Board of Appeal 3.2.05
of 28 January 2025

Appellant: (Patent Proprietor)	4JET Technologies GmbH Otto-Lilienthal-Straße 1 52477 Alsdorf (DE)
Representative:	Dilg, Haeusler, Schindelmann Patentanwaltsgesellschaft mbH Leonrodstraße 58 80636 München (DE)
Respondent: (Opponent)	Hankook Reifen Deutschland GmbH Siemensstraße 14 63263 Neu-Isenburg (DE)
Representative:	Meissner Bolte Partnerschaft mbB Patentanwälte Rechtsanwälte Postfach 86 06 24 81633 München (DE)
Decision under appeal:	**Interlocutory decision of the Opposition Division of the European Patent Office posted on 12 April 2023 concerning maintenance of the European Patent No. 3297816 in amended form.**

Composition of the Board:

Chairman	P. Lanz
Members:	O. Randl
	M. Blasi

Summary of Facts and Submissions

I. The patent proprietor filed an appeal against the interlocutory decision of the opposition division on the version in which European patent No. 3297816 ("the patent") can be maintained.

II. The opposition division was of the opinion that the subject-matter of claim 1 of the patent as granted was not new over the prior art, and that auxiliary request 1 was not clear. However, auxiliary request 2 was found to comply with the requirements of the EPC.

III. Of the documents considered by the opposition division, the following were relevant to the appeal.

D5 DE 10 2013 223 567 A1
D9 Extract from John F. Ready, "LIA Handbook of Laser Materials Processing", Laser Institute of America, Magnolia Publishing, Inc., 2001
D10 Extract from John C. Ion, "Laser Processing of Engineering Materials", Elsevier, Amsterdam, 2005

With its reply to the statement of grounds of appeal, the respondent filed the following further document.

D44 "Firestar ti-Series Operator's Manual" published by Synrad in November 2013.

IV. Oral proceedings before the board were held on 28 January 2025. At the end of the oral proceedings, the appellant withdrew its main request and auxiliary requests 1, 3 and 4.

V. The appellant (patent proprietor) requested that the decision under appeal be set aside and that the patent be maintained as amended on the basis of the claims of auxiliary request 2, which had been filed with its statement of grounds of appeal.

VI. The respondent (opponent) requested that the appeal be dismissed. It also requested that auxiliary request 2 not be admitted. In the event that auxiliary request 2 was admitted, document D44 should also be admitted.

VII. Independent claim 1 of auxiliary request 2 reads as follows (the feature references used by the board have been inserted in square brackets; additions with respect to claim 1 as granted are underlined).

"1. [**1**] Method of marking a rubber article (102), the method comprising:
[**2**] generating a recess pattern (122, 222, 322, 422, 522) in the rubber article (102) [**2.2**] by removal of rubber material, [**3**] the recess pattern (122, 222, 322, 422, 522) defining a digital code pattern, wherein
[**3.1**] said removal of rubber material is performed with an electromagnetic radiation beam, wherein
[**3.2**] the radiation beam is a laser beam (112) and wherein
[**3.3**] the $1/e^2$ beam width of the radiation beam is larger than 200 µm;
[**4**] the digital code pattern comprising an array of code modules (150);
[**5**] the digital code pattern being a binary code pattern of which the code modules (150) represent either a digital "0" or a digital "1";
[**6**] the recess pattern (122, 222, 322, 422, 522) comprising a first recess portion (124) and a second recess portion (126), the first and second recess

portions being recessed with respect to an unaltered surface of the rubber article;
[**7**] the recess pattern (122, 222, 322, 422, 522) defining code modules with relatively low reflectivity, wherein a code module comprising a recess portion (122, 124) represents a code module with relatively low reflectivity compared to a code module with a relatively high reflectivity having no recess portion;
[**8**] the first recess portion (124) and the second recess portion (126) defining therebetween a protrusion (130) protruding over a bottom (132, 134) of each recess portion;
wherein [**9a**] a pitch (136) between the first recess portion and the second recess portion is larger than 0.5 mm; or
wherein [**9b**] the first recess portion (124) and the second recess portion (126) are part of a recess (152) surrounding the protrusion and the protrusion (130) has a base area of more than 0.2 square millimeters;
[**10**] the method further comprising generating at least one of the first recess portion (124) and the second recess portion (126) with an aspect ratio between 0.2 and 2, wherein the aspect ratio is defined as the depth of the recess portion over the width of the recess portion."

Unlike the set of claims of the patent as granted, auxiliary request 2 contains no product claims.

NB: Claim 1 of former auxiliary request 2, which the opposition division found to comply with the requirements of the EPC, differs from claim 1 of current auxiliary request 2 in that in feature 3.2 the laser was required to be a carbon dioxide laser (feature **3.2'**), and in that the following additional features were included: "wherein [**11a**] the Rayleigh

length of the radiation beam is larger than 1.5 millimeters; and [**11b**] the method comprising adjusting the focus position of the radiation beam in the direction of the radiation beam during generating the digital code pattern".

VIII. The parties' submissions concerning the issues that proved relevant for the outcome of the appeal may be summarised as follows.

(a) Admittance of auxiliary request 2

(i) Respondent

Auxiliary request 2 should not be admitted. The features of claim 2 as granted, which are now introduced into claim 1, were considered in the opposition proceedings from the very beginning. Claim 2 as granted comprises multiple alternatives, all of which are known from the prior art. In the opposition proceedings, the appellant chose to make all the features of claim 2 mandatory because this approach made it the most difficult for the respondent to show that the claim was not patentable. Broadening the scope on appeal after a very thorough examination of the case by the opposition division (the oral proceedings lasted for two days) cannot be considered a response to a surprising outcome. The appellant has already filed over 15 requests during the opposition proceedings. It could also have filed what is now auxiliary request 2 within the time limit offered by the opposition division to file requests.

(ii) Appellant

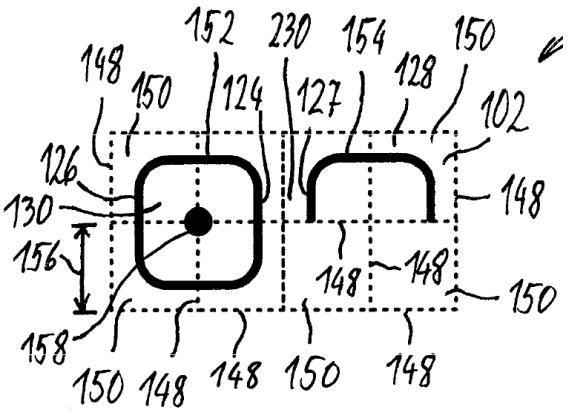
Auxiliary request 2 was filed in response to the opposition division's change of mind regarding the novelty of the former main request over document D5, and to its justification in the written decision. The opposition division allowed the appellant to file one auxiliary request. As the detailed reasons for the dismissal of the main request were not at that point known, the appellant had the impression that it was best to move forward by combining claims 1 and 2. Even then, the appellant considered that the large laser beam was not suitable for obtaining the small structures disclosed in document D5. However, as the opposition division's reasoning was unknown, amending the claim only in this respect seemed risky. The arguments that were received with the written decision are unconvincing, and this triggered auxiliary request 2. The 15 auxiliary requests mentioned by the respondent were filed in response to the numerous objections raised by the respondent and to the opposition division's provisional opinion.

(b) Claim interpretation

(i) Appellant

To determine the meaning of "recess portion", the whole of claim 1 needs to be taken into account. The recess portions are part of a recess pattern. The recess pattern "defines", i.e. determines, code modules with low reflectivity. This is not just a structural but also a functional feature. A code module comprising a recess portion "represents", i.e. embodies, a code module with low reflectivity. In Fig. 3 of the patent,

the dashed lines 148 are edges of code modules. Paragraph [0085] of the patent states that they are logical edges. A recess pattern is engraved in the rubber article. The software recognises the arrangement of portions of high and low reflectivity and identifies the code. The structure of the code module does not have to correspond one-to-one to one recess portion. As stated in paragraph [0060] of the patent, recess portions can overlap. In this case the protrusion formed between the recess portions is lowered with respect to the surface of the rubber article. This has nothing to do with the change in reflectivity.



(ii) Respondent

Claim 1 defines different structural and logical entities: there are structural elements (recesses and protrusions) that provide the logical entities (digital code pattern, code modules, binary code). The structural limitations of the recess portions consist in the recesses with respect to an unaltered surface. Code modules with recesses have lower reflectivity than a code module without recesses. The claim leaves open whether the code module is completely constituted by a recess portion or whether the recess portion is just a part of the code module; both are covered by claim 1.

(c) Inventive step of the subject-matter of claim 1 in view of document D5 and the skilled person's common general knowledge

(i) Appellant

Document D5 discloses a surface profile on the bottom of the structures shown in Figs. 6 to 9. It discloses several possible ways in which the low reflectivity can be obtained. In Fig. 4 of document D5, the entire surface structure is lowered with respect to the surface of the rubber article. This has no impact on the reflectivity. The latter is determined by the structure on the bottom of the code module. The slopes have a sub-structure shown in Fig. 5 with steps having a height of 20 µm, far smaller than the claimed sizes. Until the present invention, it was assumed that small structural elements were needed to obtain the low reflectivity.

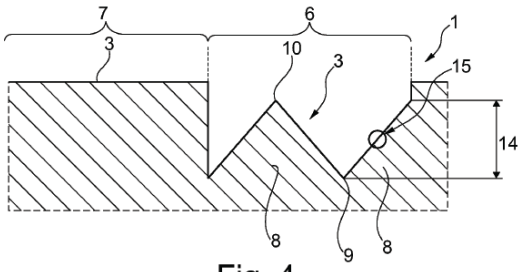


Fig. 4

According to the second sentence of paragraph [0056] of document D5, the surface profile 3 of cell 6 is designed to absorb more light than the surface profile 3 of cell 7. Each cell corresponds to a code module. It is not the amount of recess but the surface profile 6 and its step structure (see Fig. 5) that are responsible for the reduced reflectivity. The recess portion to be taken into account is delimited by the upper line, used to define the height 14. Thus, the pitch referred to in claim 1 is the distance between two neighbouring tips 9. Paragraph [0053] of document D5 discloses that this distance is equal to 0.24 mm, which is less than the

pitch required by feature 9a (0.5 mm). Feature 9b is not disclosed either. A cell 6 is not a recess portion as claimed. Moreover, the free space between the parallel ridges of adjacent code modules of Fig. 4 of document D5 does not extend along the code modules (or even surround a white code module): it necessarily extends parallel to the ridges. Document D5 does not anticipate the idea of the invention but is contrary to it, because in document D5 the effect is obtained with small structural elements, whereas in the patent large structural elements with low reflectivity are used. Document D5 does not disclose direct engraving of the rubber article. The embodiment of Figs. 6 to 9 is distinct from the one of Figs. 1 to 5. Even for the former, there is no disclosure of engraving a rubber article. The German expression "bzw." in paragraph [0058] can mean "or" or "more specifically". The skilled person would have understood it to have only the latter meaning. They would have realised that the vertical resolution needed (0.2 mm / 256 = 0.78 µm) could not be obtained by direct engraving of a rubber article, but that it could be achieved by engraving the mould. Document D5 cannot be assumed to present the option of direct engraving in the context of an embodiment where it cannot be used. When looking for a method to implement the embodiment of Fig. 4, the skilled person would have used the general teaching given in paragraph [0041] of document D5, which does not refer to direct engraving of the rubber article.

Document D9 is too specific and complete to be considered the expression of the skilled person's common general knowledge. The dimensions of the surface profile elements disclosed in document D5 are very small: they are in the micrometre range. As mentioned above, the distance between the tips 9 is 0.24 mm. It

is specifically the structure that results in the low reflectivity. Even if considering document D9, the skilled person would not have envisaged the use of a beam with a $1/e^2$ beam width larger than 200 µm for providing such fine surface structures. Document D9 establishes that it was known to use large beam sizes, but that disclosure is given in the context of writing characters that are readable by a person and have a height of 2 to 20 mm (D9, p. 526). The skilled person would not have used such a laser when implementing document D5, not even for the embodiment of Fig. 4, because the elements 8 have a triangular cross-section and a fine step structure (see Fig. 5), which is disclosed as advantageous in paragraph [0027]. Contrary to the respondent's assertion, the very wording of features 3.1 to 3.3 excludes any focusing of the beam: the rubber material is removed with the beam, of which the width is specified.

(ii) Respondent

Document D5 has the same objective as the patent (see its paragraph [0007]) and achieves this effect by similar means. The way in which different reflectivity values are achieved is disclosed in paragraph [0025]. Paragraph [0032] explains that it is advantageous if the surface profile of a cell matches the surface profile of the product. Paragraph [0051] describes the QR code of Fig. 2. Cell 6 has recesses in relation to the surface of the product. Thus, there are two types of cells with different reflectivity due to their engraved structure. It is incorrect to associate the deepest point 9 in Fig. 4 with the recess portion of claim 1. The entire cell 6 is recessed with respect to the unaltered surface, and constitutes the recess portion. Paragraph [0051] discloses that the corres-

ponding pitch is 0.69 mm. Feature 9a is fulfilled. According to the second sentence of paragraph [0056], the reflectivity of the recess portion is reduced with respect to the reflectivity of the unaltered surface, and this is because of the structure (see paragraph [0025]). The description of Figs. 3 to 5 does not disclose how these structures are to be manufactured. The skilled person trying to implement Fig. 5 would have continued reading. The embodiment of Figs. 6 to 9 employs the same concept. Paragraph [0058] discloses that a surface profile 3 of this kind, or the complementary surface profile of a moulding tool for producing a surface profile 3 of this kind on a product surface 1, can be created by laser engraving. The expression "bzw." should not be read as meaning "in particular". Laser engraving of rubber was well known to the skilled person at the priority date (see documents D9, D10). On page 180 of document D9 it is disclosed that removal of rubber results in a roughening of the surface finish. Thus, the skilled person knew that the product surface's reflectivity could be modified in this way. The skilled person would have understood this teaching to apply directly to the embodiment of Fig. 4 of document D5. At the very least, the skilled person would have taken it into account when seeking a way to implement the embodiment of Fig. 4. The argument that the skilled person would have understood that direct engraving of the rubber material was not possible in view of the sub-micron dimensions of the structures to be obtained is true for the embodiments of Figs. 6 to 9, but not for the embodiment of Fig. 4. Laser engraving can be used to obtain these much coarser structures. The skilled person would have understood that the idealised structure of Fig. 4 was probably not achievable in practice but that the desired effect could be obtained even with a non-

perfect structure. The sub-structure of Fig. 5 is not mandatory. Also, there is no upper limit to the laser beam size in claim 1, so its size cannot be an argument in favour of inventive step.

In regard of the problem-solution approach, and in particular of the technical effect of features 3.1 to 3.3, paragraph [0046] of the patent states that it "facilitates providing a suitable laser beam for performing the method". No technical effect is associated with these features. Features 3.1 to 3.3 do not mention a CO_2 laser but only a laser beam having a certain size. Document D9 does represent the skilled person's common general knowledge in the field of laser engraving. It is mentioned throughout document D9 that the decisive step is the choice of the laser source; see in particular p. 459 of document D9, which deals with the cutting of nonmetals with Nd:YAG lasers. It mentions the problem that many organic materials are transparent to Nd:YAG laser light, or at least have a low absorption coefficient. By contrast, document D9 explains that CO_2 lasers are well suited to the engraving of rubber. This would have led the skilled person to use such lasers. The skilled person would have realised that in the embodiment of Fig. 4 of document D5, the edge structure has an edge length of 0.69 mm (see paragraph [0051]). The structure shown in Fig. 3 of document D5 can be obtained with a 200 µm laser beam. The triangular shape does not have to be exactly reproduced: rounded shapes, cylinder shapes etc. are for example possible. There is no need to have a perfect structure. Incidentally, it is not even clear from the claim wording that focusing of the beam is excluded (see also, in the patent, paragraph [0074], where the beam width is 400 µm, and paragraph [0088],

according to which a single module has a lateral size of 517 µm).

The person skilled in the art would also have considered document D44, an operator's manual for the material-machining CO_2 laser series Firestar by Synrad. The laser is suitable for engraving operations, as disclosed on p. 39 of document D44. Some laser parameters for Firestar ti60 are summarised in table 3-7 on p. 330 of document D44. The beam waist diameter at $1/e^2$ is indicated, with the values for all wavelengths lying well above the claimed limit of 200 µm. Therefore, the person skilled in the art would also have arrived at the subject-matter of claim 1 when considering document D5 in combination with document D44.

Reasons for the Decision

1. Admittance of auxiliary request 2 and document D44

1.1 The set of claims of auxiliary request 2 was filed for the first time with the appellant's statement of grounds of appeal. Its admittance is within the board's discretion under Article 12(4) and (6) RPBA.

After issuing its provisional opinion, the opposition division changed its view on the novelty of the subject-matter of the patent as granted over the disclosure of document D5. The appellant was offered the opportunity to file auxiliary requests. Claim 1 of what was then auxiliary request 2 comprised additional features 3.1, 3.2', 3.3, 11a and 11b. This request was found to comply with the requirements of the EPC.

Claim 1 of present auxiliary request 2 is broader in scope, because several of the additional features in claim 1 of the request found by the opposition division to comply with the EPC have been removed. Nonetheless, the examination of present auxiliary request 2 of intermediate scope was not circumvented. This is because the opposition division's conclusion that former auxiliary request 2 complied with the requirements of the EPC was reached via an examination of the inventive contribution of all the additional features. Consequently, the conclusion which the opposition division would have drawn in respect of claim 1 of present auxiliary request 2 is apparent from the reasons for the decision under appeal.

In these circumstances, the admission of present auxiliary request 2 did not lead to a situation in which completely new issues would have had to be considered on appeal for the first time nor to the situation that a remittal of the case to the opposition division would have become necessary or desirable.

Thus the board decided to admit auxiliary request 2 in application of Article 12(4) and (6) RPBA.

1.2 Document D44 was filed by the respondent with the reply to the appellant's statement of grounds of appeal, hence its admittance is governed by the provisions set out in Article 12(4) RPBA.

Document D44 was submitted in reaction to the filing of the set of claims of auxiliary request 2. As a consequence of the board's decision to admit auxiliary request 2, the board also admitted document D44 as state of the art under Article 54(2) EPC.

2. Claim interpretation

2.1 "Recess portion"

According to claim 1, the recess pattern generated in the rubber article comprises "recess portions", i.e. portions that are recessed relative to an unaltered surface portion of the rubber article (feature 6). The recess pattern is also required to define code modules. A code module may comprise a recess portion (in which case its reflectivity is relatively low), but does not have to (in which case its reflectivity is higher).

The parties disagreed on whether a recess portion could be a code module of the recess pattern, or whether these two concepts had to be strictly separated. It is clear from feature 7 that a code module can comprise a recess portion. What was disputed is whether a code module could be "nothing but" a recess portion. The board concluded that this was indeed possible. The term "recess portion" provides a structural description of a specific portion of the surface of the rubber article, whereas "code module" refers to an element of the array forming the digital code pattern. The possibility that the recessed portion and the code module coincide is not ruled out.

2.2 Beam width (features 3.1 to 3.3)

The wording of features 3.1 to 3.3 is such that the rubber is removed using a beam that has a $1/e^2$ beam width larger than 200 µm. The case in which a beam having a beam width larger than 200 µm is focused to obtain a beam width smaller than 200 µm before the rubber removal takes place is not covered by claim 1.

3. Inventive step of the subject-matter of claim 1, starting from document D5 - Article 56 EPC

Document D5 discloses a method for obtaining a product surface 1 having an opto-electronically readable code 5 formed by an arrangement of flat cells 6,7 of different cell types. The profiled surface of one cell type comprises elevation(s) or depression(s) relative to the product surface such that its reflectivity differs.

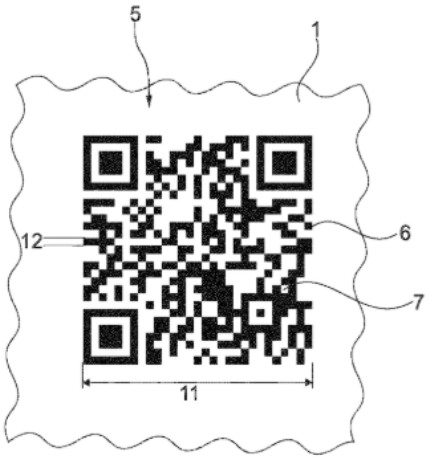


Fig. 2

3.1 Distinguishing features

In point 3.1 of the decision under appeal, the opposition division found that the subject-matter of claim 1 as granted (i.e. the combination of features 1, 2, 2.2, 3 and 4 to 10) was disclosed in document D5.

It is undisputed that document D5 does not disclose feature 3.3. The disclosure of several other features of claim 1 in document D5 is disputed.

3.1.1 Removal of rubber material using a laser beam (features 2, 2.2, 3.1 and 3.2)

The appellant disputed that document D5 disclosed a method in which rubber material was removed to generate a recess pattern. The opposition division considered that this feature was disclosed in paragraph [0058] of

document D5. This paragraph belongs to the description of the embodiments of Figs. 6 to 9. It reads:

> "*Die Höhe der Erhebungen und/oder Vertiefungen des Oberflächenprofils 3 sind im Graustufenbild durch 256 Graustufen dargestellt. Schwarz stellt den tiefsten Punkt, weiß den höchsten Punkt des Oberflächenprofils 3 dar. Der Höhenunterschied beträgt dabei 0,2 mm. Durch die diskrete Höhenabstufung gemäß der diskreten Graustufenwerte weisen die Elemente 8 der Oberflächenprofile 3 eine Treppenstruktur auf. Ein solches Oberflächenprofil 3 bzw. das hierzu komplementär ausgebildete Oberflächenprofil eines Formwerkzeuges zur Herstellung eines solchen Oberflächenprofiles 3 auf einer Produktoberfläche 1 kann beispielsweise durch Lasergravur erzeugt werden*. ..." (Underlining added by the board.)

The board's translation of this passage reads:

> "The height of the elevations and/or depressions of surface profile 3 is represented by 256 shades of grey in the greyscale image. Black represents the lowest point and white represents the highest point of surface profile 3. The difference in height is 0.2 mm. Due to the discrete height gradation of the discrete grey scale values, the elements 8 of surface profiles 3 exhibit a staircase structure. Such a surface profile 3, or the complementary surface profile of a mould for producing such a surface profile 3 on a product surface 1, can be produced, for example, by laser engraving. ..."

The opposition division understood this passage to disclose that the surface profile can be produced directly by laser.

The relevant issue here is how the German expression "bzw." is to be translated in this context. It is undisputed that, in principle, "bzw.", which is short for "beziehungsweise", can have two different meanings, namely (1) "oder" ("or") and (2) "oder vielmehr, genauer gesagt" ("or rather, to be more precise"), see also the corresponding entry in the Duden Online Dictionary of the German language (www.duden.de). The precise meaning must be inferred from the context.

In the above passage, if the meaning "or" is adopted (as in the translation proposed by the board), the passage discloses that (i) the surface structure can be directly generated on the rubber product, or (ii) it can be obtained indirectly, by moulding the rubber product in a mould of which the surface has been modified accordingly. If the alternative meaning is adopted, only alternative (ii) is disclosed.

In the case in hand the translation of "bzw." by "or" is more natural. The skilled person was aware that rubber surfaces could be engraved by laser. The skilled person would have understood paragraph [0058] to mention this possibility. It would not have been self-evident at first sight that the structures of Figs. 6 to 9 could not be obtained by laser engraving, particularly as the nature of the rubber is undefined and the paragraph gives no details on the kind of laser that is to be used or what its operating conditions would be. Therefore, the board shares the opposition division's conclusion that document D5 discloses that

the rubber material can be removed by laser, in accordance with features 2, 2.2, 3.1 and 3.2.

3.1.2 Recess portions (features 9a and 9b)

The appellant argued that document D5 did not disclose recess portions within the meaning of claims 1 and 8. In this context, the opposition division referred to the code modules 6 (called *Zellen* in D5) shown in Figs. 2 and 4.

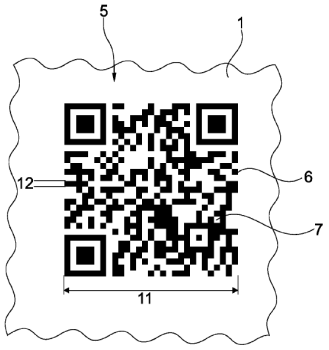


Fig. 2

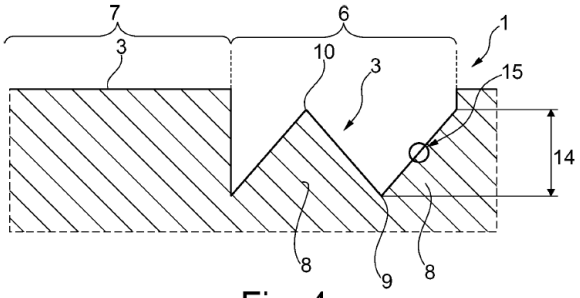


Fig. 4

The cells 6 of document D5 are portions of the pattern that are recessed with respect to an unaltered surface of the rubber article. They constitute recess portions according to feature 6, as well as code modules with relatively low reflectivity within the meaning of feature 7. The appellant's strict separation of recess portions and code modules is based on an understanding of these terms that the board does not accept; the board's understanding is explained in point 2. above.

According to paragraph [0051] of document D5, the cell pitch is about 0.69 mm. Consequently, document D5 discloses feature 9a.

3.1.3 Undue combination of embodiments

The opposition division's conclusion that the subject-matter of claim 1 as granted lacks novelty is based on the disclosure of paragraphs [0054] (feature 10) and [0058] (in particular feature 2.2).

Paragraph [0054] of document D5 refers to Figs. 3 to 5, whereas paragraph [0058] refers to Figs. 6 to 9. It is undisputed that the embodiments of Figs. 3 to 5 are distinct from those of Figs. 6 to 9.

It would have been readily evident to the skilled person that the disclosure in paragraph [0058] of possible means for forming the desired surface structure is not limited to a specific structure, but is in principle applicable to all the embodiments of document D5.

Nonetheless, if the examination of inventive step starts from a particular embodiment of a document, it is not possible, when determining the distinguishing features, to take into account features of one embodiment (such as feature 10 disclosed in the embodiment of Figs. 3 to 5) with features disclosed in the context of another embodiment (such as features 2, 2.2, 3.1 and 3.2, which are disclosed for the embodiment of Figs. 6 to 9), unless the document establishes a direct and unambiguous link between the embodiments in this respect. In the present case, there is no link that would make it possible to consider that features 2, 2.2, 3.1 and 3.2 are directly and unambiguously disclosed for the embodiments of Figs. 3 to 5. The structural similarity of the embodiments is not sufficient to establish a direct and unambiguous link.

3.1.4 Conclusion

The subject-matter of claim 1 differs from the disclosure of the embodiment of Figs. 3 to 5 of document D5 in features 2, 2.2 and 3.1 to 3.3.

3.2 Objective technical problem

The objective technical problem solved by the distinguishing features of claim 1 can be seen as the provision of a specific way of implementing the embodiment of Figs. 3 to 5 of document D5.

3.3 Obviousness to the skilled person

There is no disclosure in document D5 as to how the surface profile of the embodiment of Figs. 3 to 5 is to be obtained. The skilled person seeking a way of implementing this embodiment would have realised that document D5 provides instructions on how to implement the similar embodiments of Figs. 6 to 9, namely paragraph [0058] quoted above (see point 3.1.1). This paragraph teaches that the surface profile can be obtained by laser engraving of the rubber surface. The skilled person would have understood that these instructions can readily be applied to the embodiments of Figs. 3 to 5. On proceeding in this way, the skilled person would have implemented features 2, 2.2, 3.1 and 3.2. Consequently, these features cannot make the subject-matter of claim 1 inventive.

The board had to decide whether feature 3.3, according to which the $1/e^2$ beam width of the radiation beam is larger than 200 µm, can establish an inventive step.

In point 3.2.5 of the decision under appeal, the opposition division argued that the skilled person looking for suitable laser characteristics would have considered document D9.

The board agrees that document D9 represents the common general knowledge in the field of laser materials processing and constitutes a source of information that the skilled person would have consulted. The counter-argument that document D9 is too specific and complete to be considered the expression of the skilled person's common general knowledge is unpersuasive. Although document D9 is a very complete document, this does not disqualify its contents as an expression of common general knowledge in the field. It must not be forgotten that the skilled person is a notional person resulting from a legal fiction, not to be confused with any real person.

Chapter 15 of document D9 deals with laser marking. CO_2 lasers (section 15.3.1) are the first category of appropriate lasers (section 15.3) mentioned in document D9. Table 4 lists a series of characteristics of typical RF-excited CO_2 marking lasers. It discloses a typical dot size of between 0.1 and 0.3 mm, i.e. between 100 and 300 µm, as follows.

Table 4. Performance Characteristics of Typical RF-Excited CO_2 Marking Lasers

Parameter	Specification
Repetition rate	Up to 16 kHz
Pulse energy	6 mJ to 1 J
Average power	100 W
Dot size	0.1 to 0.3 mm diameter
Character size	2 to 20 mm high
Pulse duration	30 µs to 5 ms
Wavelength	10.2 to 11.2 µm

In view of this disclosure, the opposition division found the choice of a beam width of more than 200 µm not to be inventive.

The appellant argued that the skilled person would not have chosen a CO_2 laser because it was not suitable for generating the small and precise elements disclosed by document D5.

The board agrees. Even though the skilled person would have understood that typical RF-excited CO_2 marking lasers are suitable for engraving rubber, the skilled person would not have been led by common general knowledge to provide feature 3.3. As can be seen from Table 4 above, RF-excited CO_2 marking lasers have a beam width of between 100 and 300 µm. The use of such a broad beam is manifestly problematic in view of the fine structures that have to be achieved if the teaching of document D5 is to be implemented. In the board's view, the skilled person would not have considered a laser having such a large beam suitable for this aim. Additional focusing is not encompassed by claim 1 (see point 2.2 above). Therefore, the skilled person would have sought lasers having a smaller beam width. But even if trying to use an RF-excited CO_2

marking laser, the skilled person would have used a model having the smallest possible beam width available, i.e. close to 100 µm. In choosing such a laser, the skilled person would not have implemented a method comprising feature 3.3.

Thus, the skilled person starting from document D5 and using their common general knowledge as evidenced by document D9 would not have arrived at a method falling within the scope of claim 1.

The same reasoning applies to the objection based on the combination of documents D5 and D44. Table 3-7 on page 330 of document D44 discloses beam waist diameters at $1/e^2$ well above the claimed limit of 200 µm. For the reasons given above, the skilled person would have refrained from using such lasers.

Consequently, the subject-matter of claim 1 involves an inventive step within the meaning of Article 56 EPC.

As no other objection to claim 1 of auxiliary request 2 was raised, the patent can be maintained as amended based on the set of claims of auxiliary request 2.

Order

For these reasons it is decided that:

1. The decision under appeal is set aside.

2. The case is remitted to the opposition division with the order to maintain the patent as amended with
   - claims 1 to 8 of auxiliary request 2 filed with the statement of grounds of appeal, and
   - a description and drawings to be adapted thereto, if appropriate.

The Registrar: The Chairman:

N. Schneider P. Lanz

Decision electronically authenticated